



Pediatric Epilepsy Care

Surgical Evaluations

Your child has epilepsy that is resistant to medical therapy, and therefore, may be a candidate for surgical procedures targeted at improving and in some cases, even eliminating, his or her seizures. This is the beginning of a process which can last many months during which we will perform further testing and gather additional information to ensure that surgery will be effective and can be done safely. Our top priority is to rid the patient of seizures without causing permanent neurological problems.

Here are some facts you should know about epilepsy:

FACTS

- 1) In about 1/3 patients who suffer with seizures, medicine will not achieve control and the American Academy of Neurology recommends referral to a neurosurgeon to consider surgical options (Weibe 2001, Engel 2012, Dwivedi 2017)**
- 2) Especially in young children with developing brains, repeated seizure activity and sometimes the medicines used to treat seizures, may impair normal brain development and cognitive functioning (Tai 2016, Vendrame 2009, Freitag 2005).**
- 3) Many neurologists and pediatricians are not aware of the benefits of surgery, do not properly know how to pick patients who might benefit from surgery, and frequently overestimate the risks (Hakimi 2008). As a result, the Institute of Medicine published a report indicating that we are operating on a small fraction of those patients who could truly benefit and in some cases be cured by surgery (Gumnit 2012, England 2012). Many experts have referred to the underutilization of surgery for patients with epilepsy as a "national disaster."**

*If you decide to proceed down the road of considering surgery, the list provide on the back of this page has several important items to help you navigate this lengthy process:

Surgical Process

1) In addition to brain MRI studies and video EEG monitoring, several other studies may need to be done to determine if a patient is an appropriate candidate for surgery. Altogether this process may take many months.

- **PET CT scan:** this study is performed in the out-patient setting and helps us see abnormally low levels of metabolism in parts of the brain that can be linked to seizure generation
- **Ictal SPECT:** this study generally requires admission to the hospital and shows increased turn-over in areas of the brain that occur at the time of a seizure
- **MEG scan:** one of only about 15 MEG scanners in the country is at Overlook Hospital in Summit, NJ; like an MRI, patients need to be still so you may be instructed to give your child a Benadryl before the procedure to ensure that he/she sleeps and does not move too much
- **Functional MRI:** this helps tell us what parts of the brain are responsible for speech and movement, critical functions to preserve
- **3T and/or stealth MRI:** 3T MRI uses a high-power magnet and can better detect subtle abnormalities of cortical development; stealth MRI is thin-cut MRI that allows us to perform neuro-navigation (aka "brain GPS") during surgery
- **Wada test:** this test helps us understand what outcomes are to be expected after epilepsy surgery in regards to speech, memory, cognitive function, and movement

2) If after performing all the required studies, your child is NOT determined to be an appropriate candidate for brain surgery, that doesn't mean we can't still offer treatment.

- Special diets (eg. ketogenic diet) can help patients by decreasing the incidence of seizures
- A small implant can be placed in the neck called a vagal nerve stimulator (VNS); while this implant rarely cures a patient of epilepsy, it can often significantly reduce the burden of seizures
- Patients with epilepsy often suffer from depression, anxiety, poor memory, and problems with concentration and attention; our multi-disciplinary team is trained to identify and address these related problems that affect quality-of-life

3) Our team works in a collaborative way with neurologists, neuropsychologists, physiatrists, radiologists, and other experts around the state who treat children with seizures. The physicians at NJPNI have connections to other surgeons all around the country to assist in expanding our growing knowledge of epilepsy and the surgical and non-surgical options we can provide patients. Almost all operative patients are discussed in multi-disciplinary conferences to obtain a professional consensus.